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(54) **DATA FILE EDIT SYSTEM, STORAGE MEDIUM, PROCESS SERVER, AND USER CLIENT**

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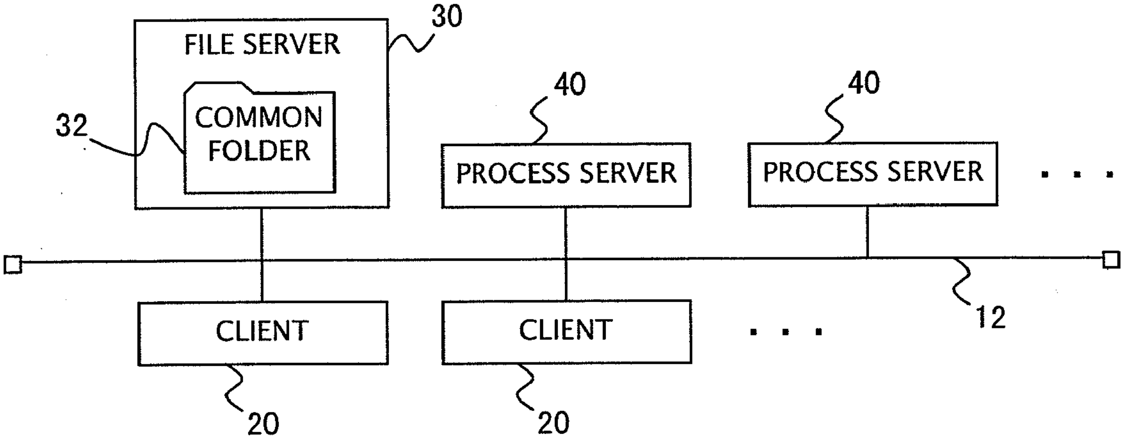
(57) **ABSTRACT**

A process server is included in a data file edit system together with a file storage unit that stores a data file to be shared so as to be accessed only from a client, a provider client and a user client, and comprises an edit request receiving unit that receives an edit request; a generation unit that generates edit process attribute information which contains process identifying information of an edit process to be carried out in response to the edit request and its own server identifying information; an attribute information transmitting unit that transmits the edit process attribute information to the provider client having transmitted the edit request; and an editing unit that carries out an edit process specified by the edit instruction information, on a data file stored in the file information memory, and storing edited data generated in the edit process in an edited data memory.



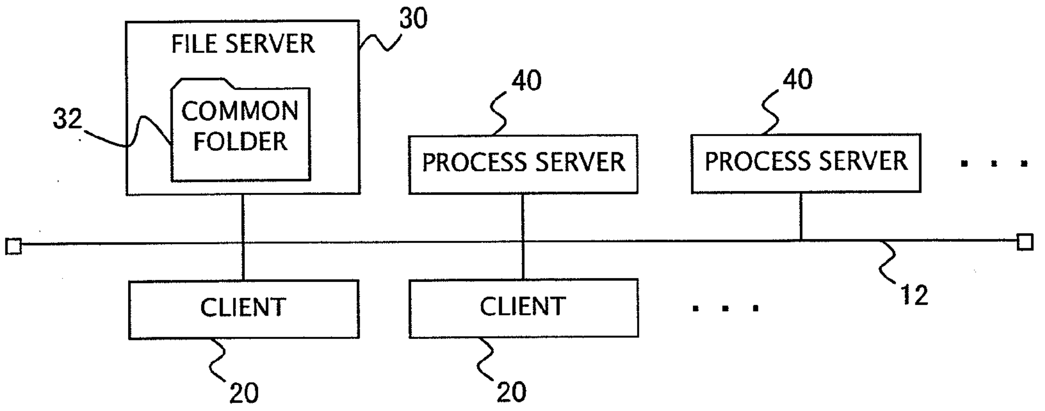

FILE SERVER
30
COMMON FOLDER
32
40
PROCESS SERVER
40
PROCESS SERVER
. . .
12
CLIENT
CLIENT
. . .
20
20

Fig. 1

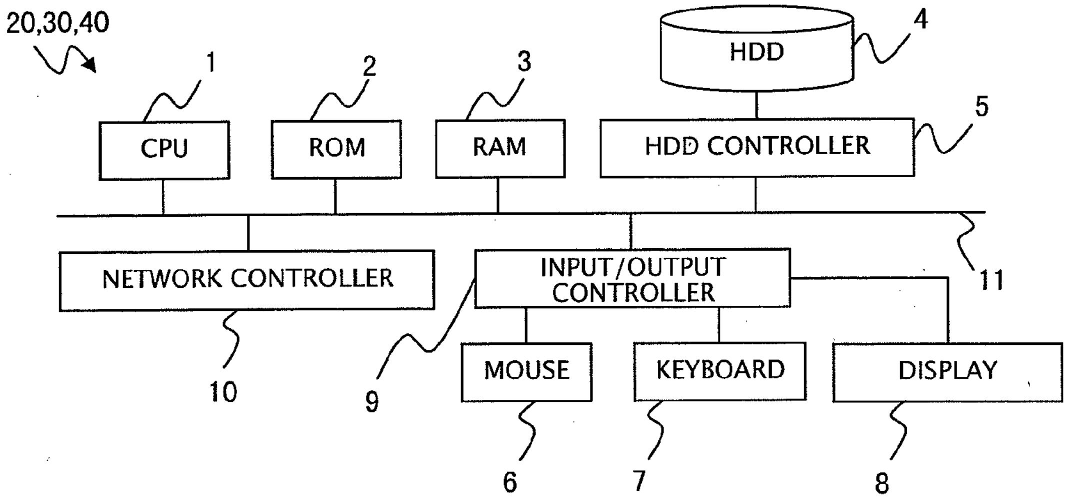

20,30,40
1
CPU
2
ROM
3
RAM
HDD
4
HDD CONTROLLER
5
11
NETWORK CONTROLLER
10
INPUT/OUTPUT CONTROLLER
9
MOUSE
6
KEYBOARD
7
DISPLAY
8

Fig. 2

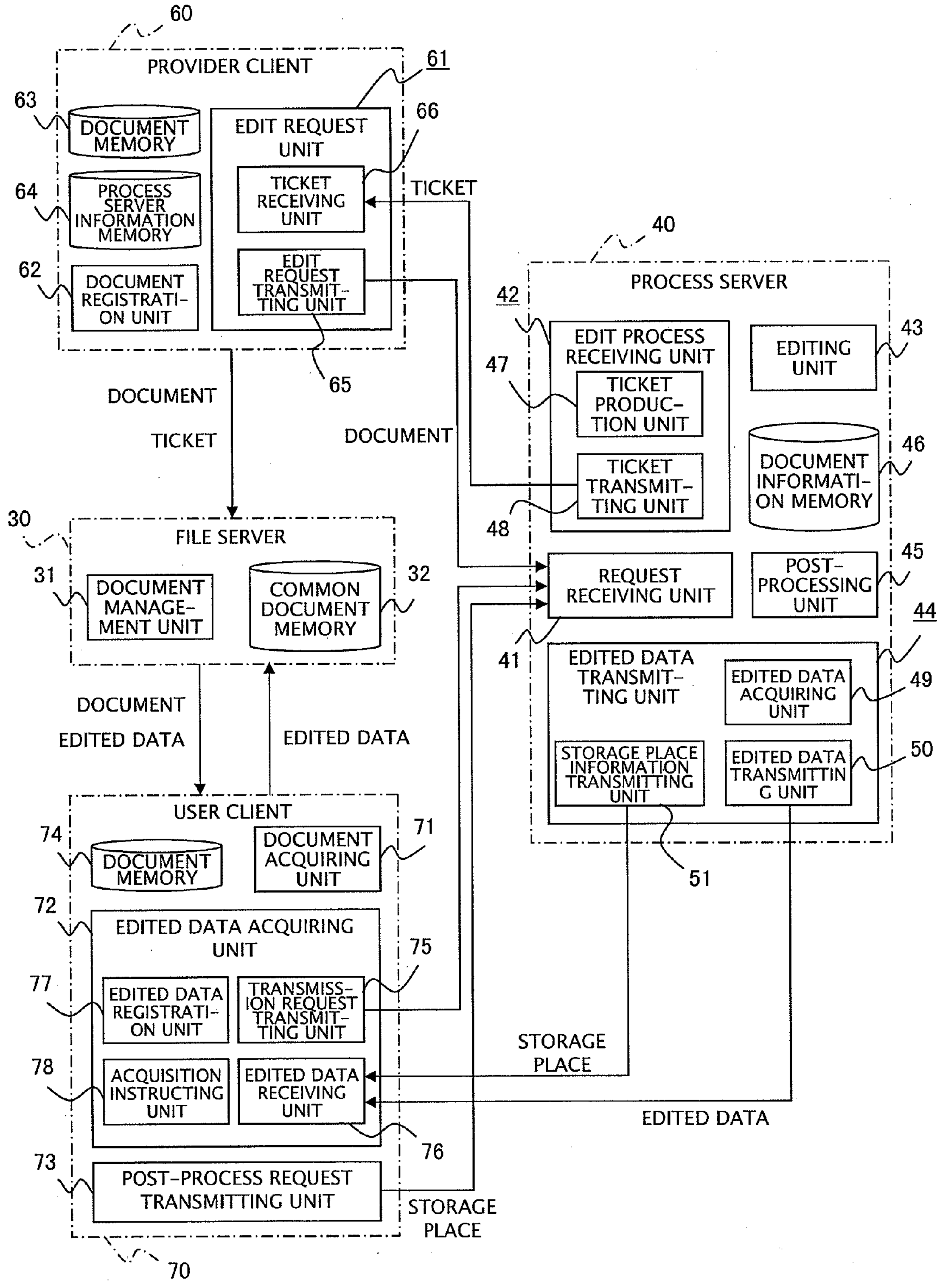

60
PROVIDER CLIENT
61
63
DOCUMENT MEMORY
EDIT REQUEST UNIT
66
TICKET RECEIVING UNIT
TICKET
64
PROCESS SERVER INFORMATION MEMORY
62
DOCUMENT REGISTRATI-ON UNIT
EDIT REQUEST TRANSMIT-TING UNIT
40
PROCESS SERVER
42
EDIT PROCESS RECEIVING UNIT
EDITING UNIT
43
65
47
TICKET PRODUC-TION UNIT
DOCUMENT
TICKET
DOCUMENT
DOCUMENT INFORMATI-ON MEMORY
46
TICKET TRANSMIT-TING UNIT
48
30
FILE SERVER
31
DOCUMENT MANAGE-MENT UNIT
COMMON DOCUMENT MEMORY
32
REQUEST RECEIVING UNIT
POST-PROCESSING UNIT
45
44
41
EDITED DATA TRANSMIT-TING UNIT
EDITED DATA ACQUIRING UNIT
49
DOCUMENT
EDITED DATA
EDITED DATA
STORAGE PLACE INFORMATION TRANSMITTING UNIT
EDITED DATA TRANSMITTIN G UNIT
50
USER CLIENT
74
DOCUMENT MEMORY
DOCUMENT ACQUIRING UNIT
71
51
72
EDITED DATA ACQUIRING UNIT
75
77
EDITED DATA REGISTRATI-ON UNIT
TRANSMISS-ION REQUEST TRANSMIT-TING UNIT
STORAGE PLACE
78
ACQUISITION INSTRUCTING UNIT
EDITED DATA RECEIVING UNIT
EDITED DATA
76
73
POST-PROCESS REQUEST TRANSMITTING UNIT
STORAGE PLACE
70

Fig. 3

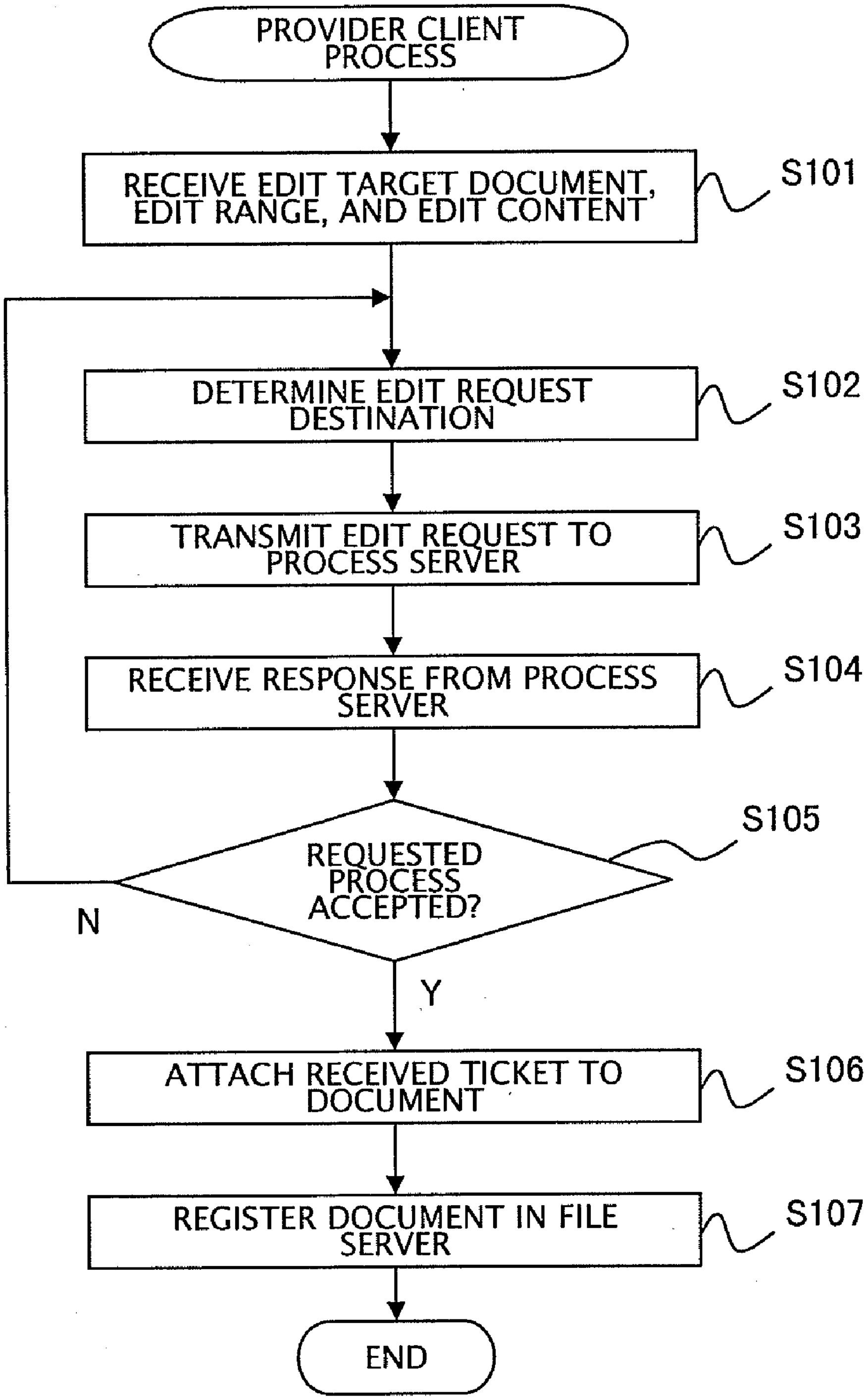

PROVIDER CLIENT PROCESS
RECEIVE EDIT TARGET DOCUMENT, EDIT RANGE, AND EDIT CONTENT
S101
DETERMINE EDIT REQUEST DESTINATION
S102
TRANSMIT EDIT REQUEST TO PROCESS SERVER
S103
RECEIVE RESPONSE FROM PROCESS SERVER
S104
REQUESTED PROCESS ACCEPTED?
S105
N
Y
ATTACH RECEIVED TICKET TO DOCUMENT
S106
REGISTER DOCUMENT IN FILE SERVER
S107
END

Fig. 4

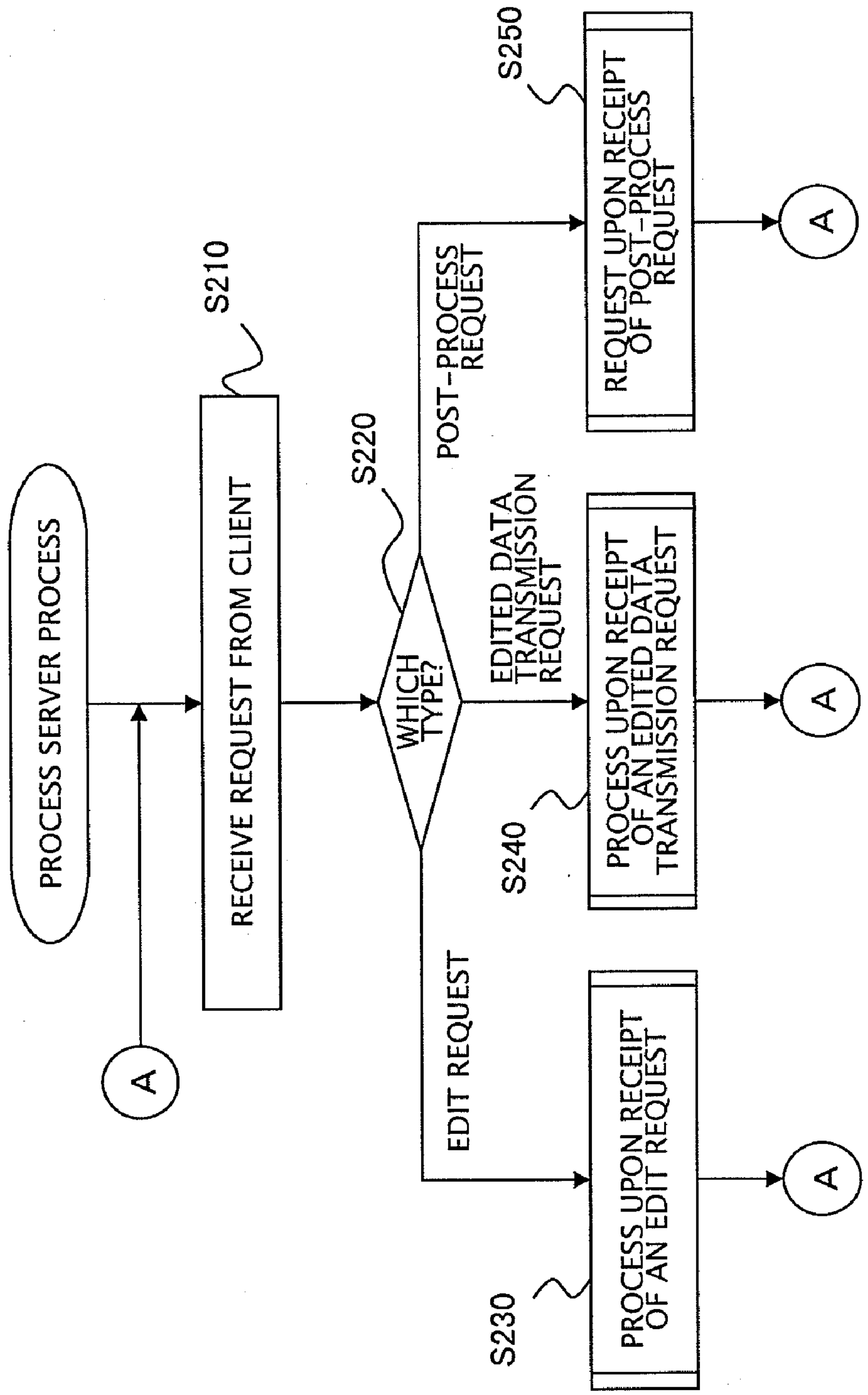

PROCESS SERVER PROCESS
S210
RECEIVE REQUEST FROM CLIENT
A
S220
WHICH TYPE?
EDIT REQUEST
EDITED DATA TRANSMISSION REQUEST
POST-PROCESS REQUEST
S230
PROCESS UPON RECEIPT OF AN EDIT REQUEST
S240
PROCESS UPON RECEIPT OF AN EDITED DATA TRANSMISSION REQUEST
S250
REQUEST UPON RECEIPT OF POST-PROCESS REQUEST
A
A
A

Fig. 5

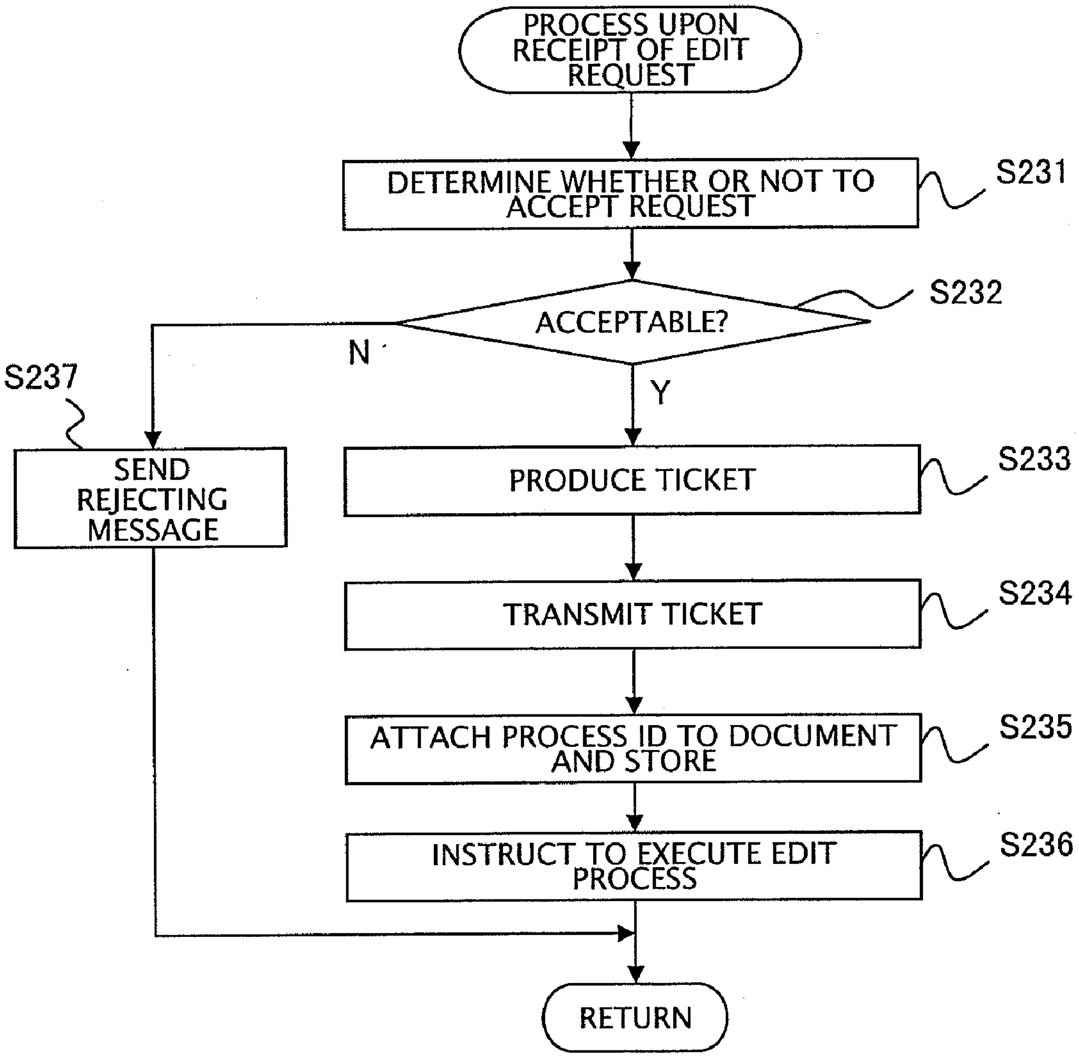
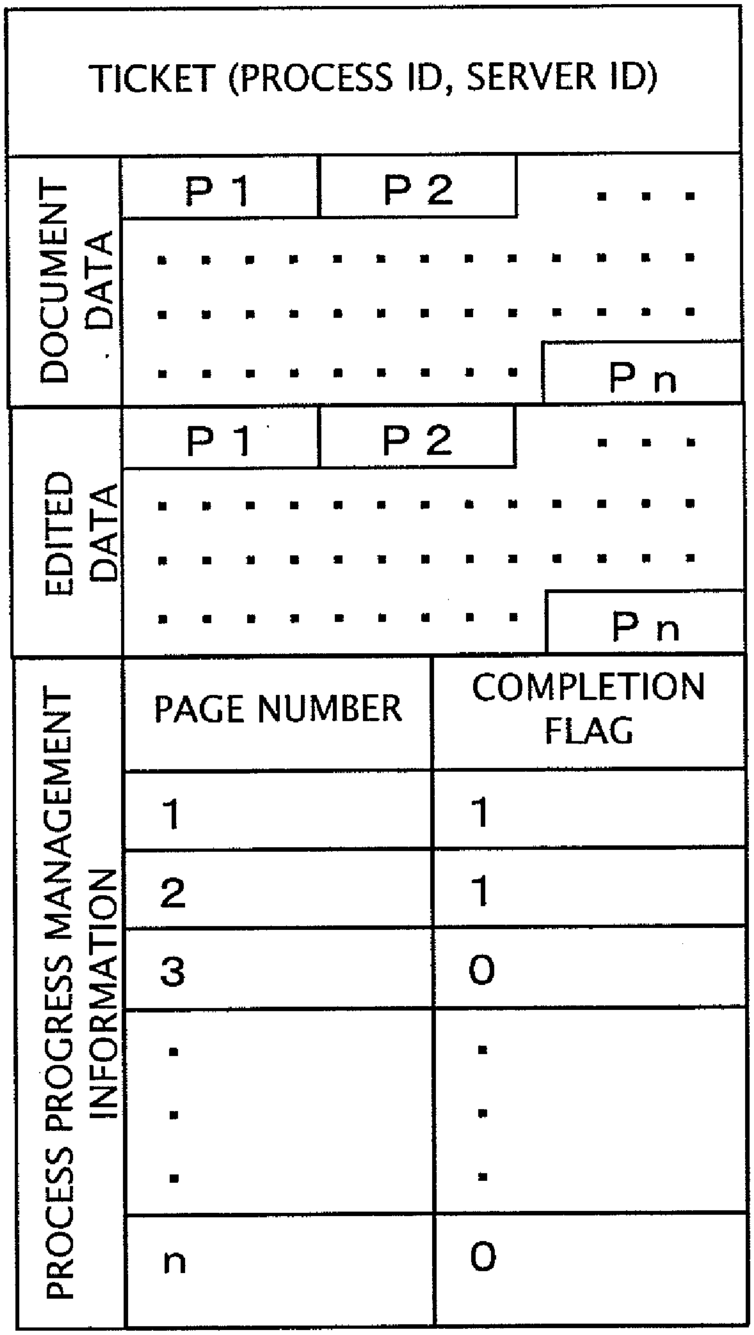

PROCESS UPON RECEIPT OF EDIT REQUEST
DETERMINE WHETHER OR NOT TO ACCEPT REQUEST
S231
ACCEPTABLE?
S232
N
Y
S237
SEND REJECTING MESSAGE
PRODUCE TICKET
S233
TRANSMIT TICKET
S234
ATTACH PROCESS ID TO DOCUMENT AND STORE
S235
INSTRUCT TO EXECUTE EDIT PROCESS
S236
RETURN

Fig. 6


TICKET (PROCESS ID, SERVER ID)
DOCUMENT DATA
P 1
P 2
P n
EDITED DATA
P 1
P 2
P n
PROCESS PROGRESS MANAGEMENT INFORMATION

PAGE NUMBER	COMPLETION FLAG
1	1
2	1
3	0
⋮	⋮
n	0

Fig. 7

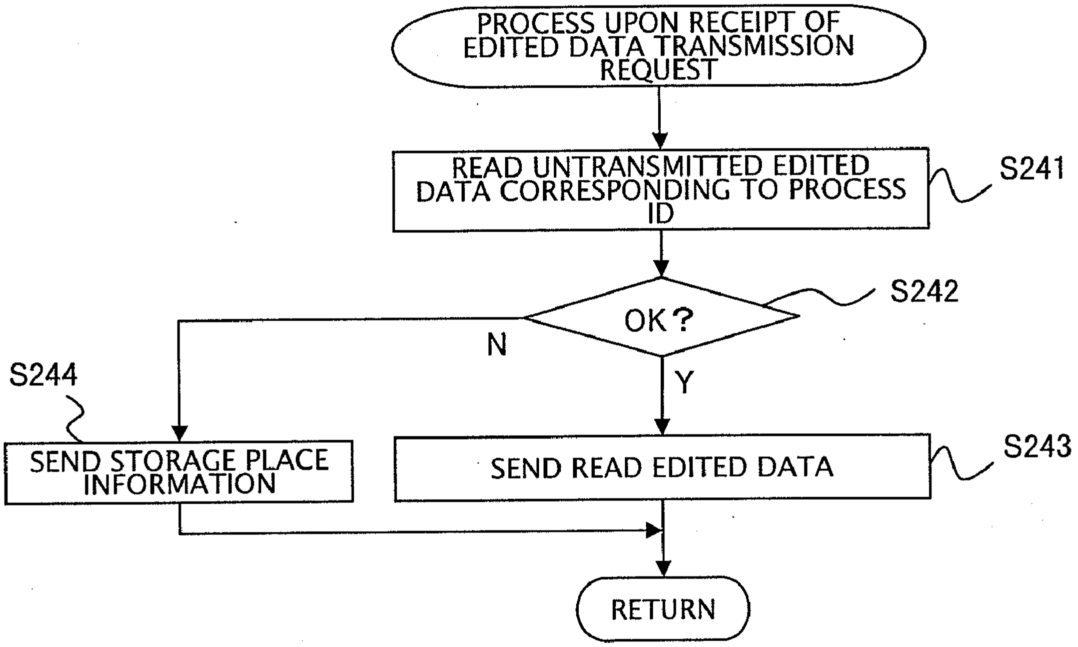

PROCESS UPON RECEIPT OF EDITED DATA TRANSMISSION REQUEST
READ UNTRANSMITTED EDITED DATA CORRESPONDING TO PROCESS ID
S241
OK?
S242
N
Y
S244
SEND STORAGE PLACE INFORMATION
SEND READ EDITED DATA
S243
RETURN

Fig. 8

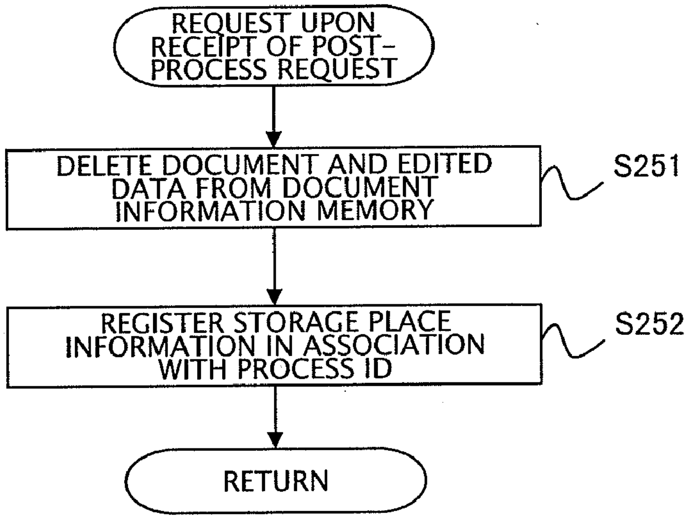

REQUEST UPON RECEIPT OF POST-PROCESS REQUEST
DELETE DOCUMENT AND EDITED DATA FROM DOCUMENT INFORMATION MEMORY
S251
REGISTER STORAGE PLACE INFORMATION IN ASSOCIATION WITH PROCESS ID
S252
RETURN

Fig. 10

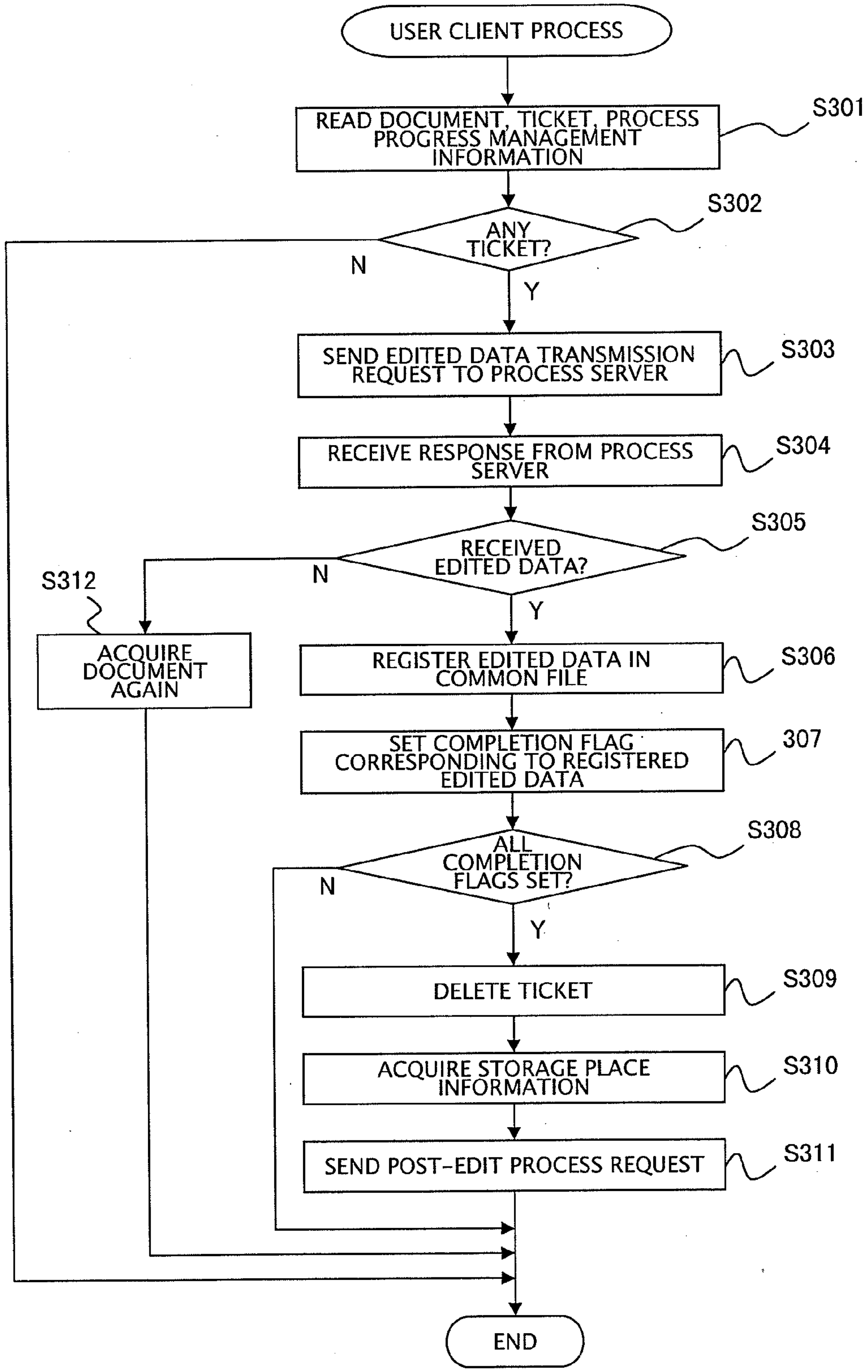

USER CLIENT PROCESS
READ DOCUMENT, TICKET, PROCESS PROGRESS MANAGEMENT INFORMATION
S301
ANY TICKET?
S302
N
Y
SEND EDITED DATA TRANSMISSION REQUEST TO PROCESS SERVER
S303
RECEIVE RESPONSE FROM PROCESS SERVER
S304
RECEIVED EDITED DATA?
S305
N
Y
S312
ACQUIRE DOCUMENT AGAIN
REGISTER EDITED DATA IN COMMON FILE
S306
SET COMPLETION FLAG CORRESPONDING TO REGISTERED EDITED DATA
307
ALL COMPLETION FLAGS SET?
S308
N
Y
DELETE TICKET
S309
ACQUIRE STORAGE PLACE INFORMATION
S310
SEND POST-EDIT PROCESS REQUEST
S311
END

Fig. 9

DATA FILE EDIT SYSTEM, STORAGE MEDIUM, PROCESS SERVER, AND USER CLIENT

PRIORITY INFORMATION

[0001] This application is based on and claims priority under 35 USC 119 from Japanese Patent Application No. 2007-143022 filed May 30, 2007.

BACKGROUND

[0002] 1. Technical Field

[0003] The present invention relates to a data file edit system, a storage medium, a process server, and a user client.

[0004] 2. Related Art

[0005] When a user wishes to process an electronic document in such a manner that imposes a large load on a computer, the client computer, if forced to do the processing, could not carry out other processing.

[0006] In an arrangement in which a server edits a data file so that the data file and the edited result are stored in a storage place, such as a file server or the like, to be shared by others, it is necessary to wait for the completion of the edit processing by the process server before the data file and the edited result are stored in the storage place in association with each other.

SUMMARY

[0007] According to one aspect of the present invention, there is provided a data file edit system, including a file storage unit that stores a data file; a provider client that provides a data file to be stored in the file storage unit; a user client that uses the data file stored in the file storage unit; and a process server that carries out an edit process requested on the data file, wherein the provider client includes an edit request transmitting unit that transmits an edit request which contains an edit target data file and edit instruction information for the data file, to the process server, an edit process attribute information receiving unit that receives edit process attribute information transmitted from the process server in response to the edit request transmitted from the edit request transmitting unit, and a file registration unit that registers the edit target data file and the edit process attribute information associated with the data file, in the file storage unit, the process server includes an edit request receiving unit that receives the edit request transmitted from the provider client, a file information memory that stores the data file contained in the edit request received by the edit request receiving unit, a generation unit that generates the edit process attribute information which contains process identifying information associated with the edit process to be carried out in response to the edit request received by the edit request receiving unit, an attribute information transmitting unit that transmits the edit process attribute information generated by the generation unit to the provider client having transmitted the edit request, an edit process execution unit that carries out an edit process specified by the edit instruction information contained in the edit request, on the data file stored in the file information memory, an edited data memory that stores edited data generated in the edit process carried out by the edit process execution unit, a transmission request receiving unit that receives an edited data transmission request transmitted from the user client, and an edited data transmitting unit that reads the edited data from the edited data memory, the edited data generated in an edit process specified by the process identifying information contained in the edited data transmission request, received by the transmission request receiving unit, and transmits to the user client having transmitted the edited data transmission request, and the user client includes an acquiring unit that acquires the data file and the edit process attribute information associated with that data file, a transmission request transmitting unit that transmits the edited data transmission request which contains the process identifying information acquired by the acquiring unit to the process server, and an edited data receiving unit that receives the edited data transmitted from the process server in response to the edited data transmission request transmitted from the transmission request transmitting unit.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Exemplary embodiments the present invention will be described in detail based on the following figures, wherein:

[0009] FIG. **1** is a diagram showing a complete structure of a data file edit system according to one exemplary embodiment of the present invention;

[0010] FIG. **2** is a diagram showing hardware structure of respective computers in this exemplary embodiment;

[0011] FIG. **3** is a block diagram showing a structure of the data file edit system in this exemplary embodiment;

[0012] FIG. **4** is a flowchart of a process carried out in a provider client in the exemplary embodiment;

[0013] FIG. **5** is a flowchart of a process carried out in a process server in the exemplary embodiment;

[0014] FIG. **6** is a flowchart of a process upon receipt of an edit request shown in FIG. **5**;

[0015] FIG. **7** is a diagram showing an example structure of data registered in a common document memory in the exemplary embodiment;

[0016] FIG. **8** is a flowchart of a process upon receipt of an edited data transmission request shown in FIG. **5**;

[0017] FIG. **9** is a flowchart of a process carried out in a user client in the exemplary embodiment; and

[0018] FIG. **10** is a flowchart of a process upon receipt of a post-edit process request shown in FIG. **5**.

DETAILED DESCRIPTION

[0019] In the following, an exemplary embodiment of the present invention will be described based on the following drawings.

[0020] FIG. **1** is a diagram showing a complete structure of one exemplary embodiment of a data file edit system according to the present invention. FIG. **1** shows a structure in which plural clients **20**, a file server **30**, and plural process servers **40** are connected to one another via a network **12**. The file server **30** is a computer storing a data file provided by a user. The client **20** is a computer for use by a provider of an electronic document, or a data file format, or a user of an electronic document provided by a provider. A single client **20** may serve as a provider client when the user thereof provides an electronic document and also as a user client when the user thereof uses an electronic document provided by another user. In consideration of security, the file server **30** may allow only the client **20**, but not the process server **40**, to access a data file registered in the common folder **32**.

[0021] It should be noted that although the network **12** is formed using a LAN (Local Area Network) in FIG. **1**, this is not an exclusive example, and any other structure which enables data exchange between the client **20** and the file server **30** and the process server **40** is applicable.

[0022] FIG. **2** is a diagram showing a hardware structure of each computer in this exemplary embodiment. The hardware structure of any computers **20**, **30**, **40** shown in FIG. **1**, which can be realized using a general purpose computer, despite possible difference in performance, can be expressed as shown in FIG. **2**.

[0023] As shown in FIG. **2**, the computers **20**, **30**, **40** each comprise a CPU **1**, a ROM **2**, a RAM **3**, a HDD controller **5** connected to a hard disk drive (HDD) **4**, an input/output controller **9** connecting to a mouse **6** and a keyboard **7**, both serving as input means, and also to a display **8** serving as a display device, and a network controller **10** serving as a communication means, all connected to an internal bus **11**.

[0024] FIG. **3** is a block diagram showing a structure of a data file edit system in the exemplary embodiment. In FIG. **3**, a client **20** serving as a provider client **60** and a client **20** serving as a user client **70** are shown separately as the client **20** serving as a provider client **60** and the client **20** serving as a user client **70** use different functions. As it is adapted to be uses as either a provider client **60** or a user client **70**, a single client **20** has all functions necessary for both purposes, though a client **20** having an exclusive use may have only the functions necessary for that use. FIG. **3** shows only one process server **40** as all process servers **40** connected to the network **12** have the same functional blocks. It should be noted that FIG. **3** shows only the functional blocks necessary in rendering the exemplary embodiment into practice, with other general purpose functions inherent to a computer omitted.

[0025] In FIG. **3**, the provider client **60** comprises an edit request unit **61**, a document registration unit **62**, a document memory **63**, and a process server information memory **64**. The edit request unit **61** sends an edit request to the process server **40** to request the process server **40** to edit an electronic document which the provider client **60** provides. The edit request unit **61** includes an edit request transmitting unit **65** and a ticket receiving unit **66**. The edit request transmitting unit **65** sends an edit request to the process server **40**, and the ticket receiving unit **66** receives a ticket which the process server **40** sends in response to the edit request from the edit request transmitting unit **65**. The document memory **63** stores an electronic document to be shared by another user and to be edited. The document registration unit **62** attaches the ticket received by the ticket receiving unit **66** to an electronic document to be shared, stored in the document memory **63**, before registering in the file server **30**. The process server information memory **64** stores information, such as performance, specifications, an application available, and so forth, about a process server **40** available to be a potential request destination.

[0026] The structural elements **61**, **62** of the provider client **60** are realized in cooperation with a computer serving as the client **60** and a program executed by the CPU **1** mounted in the computer. The memories **63**, **64** are realized using a HDD **4** mounted in the provider client **60**.

[0027] The process server **40** comprises a request receiving unit **41**, an edit process receiving unit **42**, an editing unit **43**, an edited data transmitting unit **44**, a post-processing unit **45**, and a document information memory **46**. The request receiving unit **41** receives various requests from the clients **60**, **70**. The edit process receiving unit **42** begins operating upon receipt of an edit request by the request receiving unit **41**, then determines whether or not its own server is capable of the designated edit process, and instructs the editing unit **43** to begin editing, and so forth. The edit process receiving unit **42** includes a ticket production unit **47** for producing a ticket upon receipt of an edit request. It should be noted that a ticket is edit process attribute information which contains process identifying information (hereinafter referred to as a "process ID") for identifying an edit process to be carried out in response to an edit request, and server identifying information (hereinafter referred to as a "server ID") for identifying its own server, which carries out edit processing in response to an edit request. A ticket transmitting unit **48** sends a ticket produced by the ticket production unit **47** to a provider client **60** having sent the edit request.

[0028] The editing unit **43** carries out an edit process designated by the edit request according to an instruction from the edit process receiving unit **42**. The edited data transmitting unit **44** begins operating upon receipt of an edited data transmission request by the request receiving unit **41**. The edited data transmitting unit **44** includes an edited data acquiring unit **49**, an edited data transmitting unit **50**, and a storage place information transmitting unit **51**. The edited data acquiring unit **49** reads edited data to be transmitted from the document information memory **46**, where the edited data produced by the editing unit **43** in edit processing is stored in association with the concerned electronic document. The edited data transmitting unit **50** sends the read edited data to the user client **70** having sent the edited data transmission request.

[0029] The storage place information transmitting unit **51** sends storage place information to the user client **70** having sent the edited data transmission request, the storage place information being registered in the document information memory **46**, instead of edited data, with the edited data produced in edit processing all already transmitted by the edited data transmitting unit **50**. The post-processing unit **45** begins operating upon receipt of a post-edit process request by the request receiving unit **41**, and deletes the electronic document to be edited and the edited data produced in the edit process identified by the process ID contained in the post-edit process request from the document information memory **46**. Further, the post-processing unit **45** registers the storage place information of the electronic document, contained in the post-edit process request, in the document information memory **46** so as to be associated with the process ID.

[0030] The structural elements **41** to **45** in the process server **40** are realized in cooperation with a computer serving as the process server **40** and a program to be executed by the CPU **1** mounted in the process server **40**. The document information memory **46** is realized using a HDD **4** mounted in the process server **40**.

[0031] The user client **70** comprises a document acquiring unit **71**, an edited data acquiring unit **72**, a post-process request transmitting unit **73**, and a document memory **74**. The document memory **74** stores an electronic document among those acquired by the user from the file server **30**, which the user wishes to keep in the user client **70**. The document acquiring unit **71** acquires a desired electronic document from the file server **30** or the document memory **74**. The edited data acquiring unit **72** acquires a result, that is, edited data, obtained by editing the electronic document acquired by the document acquiring unit **71** from the process server **40**. The edited data acquiring unit **72** includes a transmission request transmitting unit **75**, an edited data receiving unit **76**, an edited data registration unit **77**, and an acquisition instructing unit **78**.

[0032] The transmission request transmitting unit **75** sends an edited data transmission request containing a process ID contained in the ticket attached to an electronic document to the process server **40** identified by the server ID also contained in the ticket. The edited data receiving unit **76** receives the edited data sent from the process server **40** in response to an edited data transmission request sent from the transmission request transmitting unit **75**. The edited data registration unit **77** registers the edited data received by the edited data receiving unit **76**, in the file server **30**. In the case where the edited data receiving unit **76** receives the storage place information of an electronic document, instead of the edited data, the acquisition instructing unit **78** instructs the document acquiring unit **71** to acquire an electronic document from the storage place specified by the storage place information.

[0033] Upon completion of the editing of the electronic document and with detection that the resultant edited data is all registered in the file server **30**, the post-process request transmitting unit **73** deletes the ticket attached to the electronic document from the file server **30**, and sends a post-edit process request containing the process ID containing in the ticket and the storage place information specifying the storage place of the electronic document, to the process server **40** identified by the server ID contained in the ticket.

[0034] The structural elements **71** to **73** of the user client **70** are realized in cooperation with a computer serving as the user client **70** and a program executed by the CPU **1** mounted in the user client **70**. The document information memory **46** is realized using a HDD **4** mounted in the user client **70**.

[0035] The file server **30** comprises a document management unit **31** and a common document memory **32**. The common document memory **32** stores an electronic document provided by a document provider. According to an instruction from the client **60**, **70**, the document management unit **31** manages the data stored in the common document memory **32**, the management including registration of an electronic document and the edited data in the common document memory **32**, data reading, date deletion when necessary, and so forth. In consideration of security, the document management unit **31** may allow only the clients **60**, **70**, but not the process server **40**, to access the common document memory **32**.

[0036] The document management unit **31** of the file server **30** is realized in cooperation with a computer serving as the file server **30** and a program executed by the CPU **1** mounted in the file server **30**. The common document memory **32** is realized using a HDD **4** mounted in the file server **30**.

[0037] A program used in this exemplary embodiment may be provided via a communication means or being stored in a computer readable recording medium, such as a CD-ROM, a DVD-ROM, and so forth. A program provided via a communication means or a recording medium is installed into any of the computers **20**, **30**, **40**, and the CPU **1** of that computer **20**, **30**, **40** sequentially executes the install program, whereby various processes are carried out.

[0038] In the following, an operation in this exemplary embodiment will be described. The exemplary embodiment can be roughly divided into a process to request the process server **40** to edit an electronic document when registering the electronic document in the file server **30** and a process to acquire edited data when wishing to use an electronic data registered in the file server **30**, the acquiring process carried out separately from the process to use the electronic document.

[0039] FIG. **4** is a flowchart of a process to be carried out by the provider client **60** in this exemplary embodiment; FIG. **5** is a flowchart of a process to be carried out by the process server **40** in this exemplary embodiment; and FIG. **6** is a flowchart of a process to be carried out when an edit request is received from the provider client **60** among those to be carried out by the process server **40** in this exemplary embodiment. Initially, a process to request the process server **40** to edit an electronic document when registering the electronic document in the file server **30** will be described with reference to the flowchart.

[0040] The user of the provider client **60**, or the provider of a document, arranges to display the file name of the electronic document data (hereinafter simply referred to as a "document") stored in the document memory **63** on the display **8**, and selects a document which the user wishes to share with other users and to request the process server **40** to edit from among those of which names are displayed. A user wishing to request editing of only a part of a document, rather than the entire document, designates a range for editing (an edit target range), which is achieved by displaying the content of the document on the screen, utilizing a document application, and designating a desired range, utilizing an existing document application function. It should be noted that the entire document is designated as an edit target range in the following description. In addition, the user designates the content of an edit process which the user wishes to request the process server **40** to carry out. It is assumed here that the user designates a character recognition process utilizing an OCR (optical character recognition) function available with the process server **40** as the edit process.

[0041] With an edit target document or range, in some cases, and an edit process, all designated by the user as described above, the edit request unit **61** accepts the designation (step **101**), and compares information, such as specifications, an available application, and so forth, about the process server **40**, stored in the process server information memory **64**, and the content of the user's designation to determine which process server **40** to request to carry out the edit process (step **102**). Various methods are available for use as a reference in selection of one process server **40** to request from among plural process servers **40**. For example, a process load may be calculated based on the content (a character recognition process in this example), amount, and so forth, of the edit process, and specify a process server **40** capable of tolerating the load and capable of the edit process. In order to cope with a case in which two or more such process servers **40** are available, the process server **40** may be given a priority order in advance, or a selection rule may be determined in advance, such that a process server **40** may be selected with constant frequencies while referring to the selection history. Obviously, availability of an application capable of the requested edit process is indispensable in the selection. It should be noted that the provider client **60** itself may carry out an edit process, depending on a process load, without requesting any process server **40**, though it is determined here that any process server **40** is requested to edit.

[0042] With specification of a process server **40** to request (a request destination), the edit request transmitting unit **65** produces edit instruction information which contains the content of an edit process to request and a request type (an edit process here), and sends an edit request which contains the target document and the edit instruction information to the process server **40** determined as the request destination (step **103**).

[0043] In the process server **40**, the request receiving unit **41**, which remains in a awaiting reception state, receives the edit request from the provider client **60** (step **210**), and, knowing that the received request is an edit request with reference to the request type contained in the received request, instructs the edit process receiving unit **42** to begin operating, and supplies the received data. Thereafter, a process upon receipt of an edit request is carried out as follows (step **220**, **230**), which is described below with reference to FIG. **6**.

[0044] Initially, the edit process receiving unit **42** determines whether or not its own server is capable of the requested edit process while referring to the data received from the request receiving unit **41**, specifically, the document contained and the edit process content designated in the edit request (step **231**). The determination is made in a similar manner to that in step **102**, with additional reference to the current process load, and so forth. When it is determined that its own server can handle the request, that is, to accept the request (Y in step **232**), the ticket production unit **47** in the edit process receiving unit **42** produces edit process attribute information, or a ticket, which contains its own server ID and a process ID identifying an edit process to be carried out in response to the received edit request (step **233**). It should be noted that the process ID is information identifying the received request or a job in which the received edit process is carried out, rather than, for example, a character recognition process among various edit processes. The server ID is information, such as a URL, which can specify a transmission destination to which the user client **70** sends an edited data transmission request or the like, with details thereof to be described later. With the ticket produced, the ticket transmitting unit **48** sends the ticket to the provider client **60** having sent the edit request (step **234**).

[0045] Also, upon receipt of a request from the provider client **60**, as described above, the edit process receiving unit **42** attaches the process ID to be contained in the ticket to the received document, and stores in the document information memory **46** (step **235**). Then, the edit process receiving unit **42** forwards the edit instruction information to the editing unit **43** to instruct to carry out the edit process (step **236**), upon which the editing unit **43** reads the document specified by the process ID from the document information memory **46**, and begins a character recognition process for the process range specified by the edit instruction information.

[0046] In the process server **40**, when the process upon receipt of an edit request is completed as requested, the request receiving unit **41** shifts to an awaiting request reception state, and the editing unit **43** independently continues the character recognition process, as requested, to be completed while accumulating the processed result as edited data in the document information memory **46**. As a character recognition process is generally carried out for every page, every time the process is completed for one page, edited data for that page is written in the document information memory **46** so as to be associated with the document page data.

[0047] Meanwhile, when it is determined in S232 that the request is not accepted due to the server's inability to accomplish the requested process or the like (N in step **232**), the edit process receiving unit **42** sends a message rejecting the request, instead of a ticket, to the provider client **60** having sent the edit request (step **237**).

[0048] When the process upon receipt of an edit request is completed, the request receiving unit **41** in the process server **40** shifts to an awaiting request reception state (step **210**).

[0049] In the provider client **60**, which is then waiting for a response after the transmission of the edit request, the ticket receiving unit **66** receives the ticket, or a response, from the process server **40**, or the request destination (step **104**). With a rejecting message received, instead of a ticket, that is, on understanding that the requested process server **40** does not accept the edit processing request (N in step **105**), the edit request unit **61** repeats the selection of a process server **40** to request by determining another process server **40** as a request destination (step **102**), and carries out the process in steps **103** and **104** to determine the process server **40** to request, with the description thereof not repeated here.

[0050] Meanwhile, when a ticket is received by the ticket receiving unit **66** (Y in step **105**), the document registration unit **62** attaches the ticket to the document to register (step **106**), and registers in the file server **30** (step **107**). It should be noted that although it is arranged in the above exemplary embodiment such that the process server **40** sends a ticket to the provider client **60** and the provider client **60** attaches the ticket to the document, the process server **40** may attach the ticket to the document and send the document having the ticket attached thereto to the provider client **60**. The document management unit **31** in the file server **30** stores the received document in a common folder in the common document memory **32**, which is designated by the document provider.

[0051] In the following, a structure of data stored in the common document memory **32** will be described with reference to FIG. **7**.

[0052] FIG. **7** is a diagram showing an example of a data structure with a document registered in the common document memory **32** in this exemplary embodiment. The data registered has a document data area for storing the document, an area for storing the ticket attached to the document, an area for storing the edited data, and an area for storing process progress management information, all associated with one another. The edited data is produced by the process server **40** by carrying out edit processing, and obtained from the process server **40**, using a method to be described later. The process progress management information is flag information to be referred to in determining whether or not the edited data of each page is already acquired from the process server **40** and used in managing the presence/absence of edited data for every page. In this exemplary embodiment, the progress of a process to acquire the edit data of each page is managed using a completion flag, in which a completion flag **1** indicates a page with edited data thereof completely acquired and a completion flag **0** indicates a page with edited data thereof yet to be acquired.

[0053] In the example shown in FIG. **7**, it is known that the edited data of the first and second pages of the document data is already acquired from the process server **40**. It should be noted that the flag value is not limited to the above-described example, and that the process progress management information is not even limited to flag information and may include any information which enables management of the presence/absence of edited data of each page.

[0054] The process progress management information is used to manage the presence/absence of edited data in units of edit process. That is, in this exemplary embodiment, in which a character recognition process is carried out for every page, a completion flag is provided for each page. However, in an edit process, for example, to combine two documents into one document, a single completion flag is provided for one resultant combined document as edited data first becomes available when the process to combine the documents is completed, and included in the process progress management information. In short, a completion flag to manage the presence/absence of edited data is provided in units of edit processes.

[0055] When the process to request the process server **40** to edit a document when registering the document in the file server **30** is completed, as described above, a process to use the commonly usable document stored in the file server **30** begins. FIG. **8** is a flowchart of a process to be carried out upon receipt of an edited data transmission request from the user client **70**, among those to be carried out in the process server **40**. FIG. **9** is a flowchart of a process to be carried out by the user client **70** in this exemplary embodiment. In the following, a process to be carried out when using a document registered in the file server **30**, which is carried out separately from the process to use the document, will be described with reference to the flowchart shown in FIGS. **5**, **8**, and **9**.

[0056] Specifically, the user of the user client **70** wishing to use a document selects a document they wish to use from among those stored in the file server **30** or the document memory **74** and opens the document, utilizing a predetermined document application, which is achieved by displaying the file names of the documents stored in the common file **32** on the display **8** and selecting one from those shown. It is assumed here that a document stored in the file server **30** is selected. The document user carries out their desired edit process within a permitted range for the document whose name is shown on the display **8**.

[0057] That is, the edited data acquiring unit **72** carries out the following process as well as the document process carried out by the document user. Specifically, when reading the document selected by the document user from the file server **30**, the edited data acquiring unit **72** reads the ticket and the process progress management information, both attached to the selected document (step **301**). In the case where no ticket is read as no ticket is attached to the document (N in step **302**), it is determined that the edited data for all pages of the document is already stored in the file server **30**, and the process is terminated. That is, the document user, who continues the document process as well as the process carried out by the edited data acquiring unit **72**, can refer to the document and the edited data for all pages of the document.

[0058] Meanwhile, when the ticket can be read (Y in step **302**), the transmission request transmitting unit **75** produces an edited data transmission request containing the process ID contained in the ticket, untransmitted page information, and a request type (edited data acquisition, here), and sends the edited data transmission request to the process server **40** (step **303**), which can be identified by the server ID contained in the ticket.

[0059] The untransmitted page information contains the top page of the edited data to be acquired. The edited data having been acquired thus far from the process server **40** may be identified with reference to the completion flag, or the process progress management information. That is, when the edited data up to page m (0<=m<n) of the document having n pages has been acquired, inclusion of untransmitted page information of page (m+1) in the edited data transmission request makes it possible to inform the process server **40** of the fact that the data for page (m+1) and subsequent pages is to be acquired and thus to request to transmit the data.

[0060] In the process server **40**, the request receiving unit **41**, which is in an awaiting reception state, receives the edited data transmission request from the user client **70** (step **210**). Knowing, based on the request type contained in the received request, that the received request is an edited data transmission request, the request receiving unit **41** instructs the edited data transmitting unit **44** to begin operating, and supplies the received data. Thereafter, a process upon receipt of an edited data transmission request is carried out (steps **220**, **240**). This process will be described with reference to FIG. **8**.

[0061] That is, when the edited data transmitting unit **44** begins operating upon receipt of the data sent from the request receiving unit **41**, the edited data acquiring unit **49** in the edited data transmitting unit **44** reads the data produced in the edit process specified by the given data from the request receiving unit **41**, specifically, the process ID contained in the edited data transmission request, from the document information memory **46** (step **241**). In the above, as untransmitted page information is contained in the edited data transmission request, only the edited data for the page specified by the untransmitted page information and subsequent pages among the edited data produced by the editing unit **43** are read from the document information memory **46**. In the above, in the case where the document editing by the editing unit **43** is already completed, the edited data up to the last page is read, which makes the current data transmission the last data transmission. Also, in the case where an edited data transmission request is sent after the edited data for all pages of the document is transmitted, no edited data is left to be read (N in step **242**), with a process to be carried out in such a case to be described later. Once the edited data acquiring unit **49** acquires all edited data available for transmission, the edited data transmitting unit **50** forwards the edited data to the user client **70** having sent the edited data transmission request (step **243**).

[0062] Here, it should be noted that the purpose of including the untransmitted page information in the edited data transmission request is to avoid retransmission of transmitted edited data by specifying the edited data to be transmitted. In view of the above, it may be alternatively arranged such that information equivalent to untransmitted page information is stored in the process server **40**, instead of the arrangement in which untransmitted page information is prepared on the user client **70** side. Obviously, in a case free from the need to consider a network load, a transmission time, and so forth, transmitted edited data may be retransmitted. Alternatively, the edited data transmitted by the edited data transmitting unit **50** in step **243** may be deleted from the document information memory **46**. This makes it possible to avoid retransmission of transmitted edited data, while eliminating the need to use untransmitted page information.

[0063] With the process upon receipt of an edited data transmission request completed, the request receiving unit **41** in the process server **40** shifts to an awaiting reception state (step **210**).

[0064] In the user client **70**, which is then waiting for a response after the transmission of the edited data transmission request, the edited data receiving unit **76** receives a response from the process server **40** of the request transmission destination (step **304**). In the case where the edited data receiving unit **76** receives one or more edited data items as a response from the process server **40** (Y in step **305**), the edited data registration unit **77** registers the received edited data in the file server **30** so as to be associated with the edit target document (step **306**), and instructs to set a completion flag for the page corresponding to the edited data to be registered (step **307**). The document management unit **31** in the file server **30** registers the received edited data in the common document memory **32** so as to be associated with the document data stored therein, and sets a completion flag for the page concerned according to the instruction.

[0065] It should be noted that the document user becomes an authenticated user by logging in the system, who is entitled to use a document stored in the common document memory **32**, to register edited data to be attached to the document, and to access to set a completion flag.

[0066] When it is known by referring to the completion flag that the edited data for all pages of the document is yet to be acquired in the above described edited data acquiring process (N in step **308**), the edited data acquiring process in connection with use of the document is completed.

[0067] The above-described edited data acquiring process is carried out every time any user uses a document. That is, the user client **70** acquires edited data produced thus far from the process server **40** and registers in the file server **30** every time that document is used. When the process server **40** completes editing of the document with edited data for all of the pages of the document produced and any user thereafter uses the document, the user client **70** acquires the edited data up to the last page from the process server **40**.

[0068] It should be noted that it is possible that the edited data acquiring process to be carried out while a document is using, as described above, be carried out in parallel by plural document users. That is, plural sets of edited data acquiring processing may be carried out in parallel by plural users who use the same document at the same time. This may cause a possibility of conflict among attempts to acquire the same edited data from the process server **40**. In order to avoid the above, the process server **40** may delete transmitted edited data. Alternatively, in an arrangement using a completion flag, access to the completion flag may be locked to thereby control such that the edited data acquiring process is exclusively carried out.

[0069] Returning to FIG. **9**, when it is known that the edited data for all pages of the document is acquired with reference to the completion flag (Y in step **308**), a post-edited data acquiring process is carried out as described below. FIG. **10** is a flowchart of a process to be carried out after the edited data for the entire document is registered in the file server **30**, among those to be carried out in the process server **40**. In the following, the post-process will be described with reference to FIGS. **9** and **10**.

[0070] Specifically, knowing, with reference to the completion flag, that the edited data for all pages is already acquired (Y in step **308**), the post-process request transmitting unit **73** deletes the ticket from the document stored in the file server **30** (step **309**), obtains the storage place information about the document with the ticket deleted therefrom (step **310**), and sends a post-edit process request which contains the storage place information, the process ID contained in the ticket, and a request type (a post-edit process here) to the process server **40** identified by the server ID contained in the ticket deleted (step **311**).

[0071] In the process server **40**, the request receiving unit **41**, which is in a reception waiting state, receives the post-edit process request sent by the user client **70** (step **210**), and, knowing from the request type contained in the received request that the received is a post-edit process request, instructs the post-processing unit **45** to begin operating and supplies the data received. Thereafter, a process upon receipt of a post-edit process request to be described below (steps **220**, **250**) begins. This process will be described with reference to FIG. **10**.

[0072] The post-processing unit **45** begins operating upon receipt of the data from the request receiving unit **41**, and deletes the edit target document in the edit process identified by the given data, specifically, the process ID contained in the post-edit process request and the edited data produced in that process from the document information memory **46** (step **251**). Thereafter, the post-processing unit **45** registers the storage place information contained in the post-edit process request, instead of the data deleted, in the document information memory **46** so as to be associated with the process ID (step **252**). With the above-described process upon receipt of a post-edit process request completed, the request receiving unit **41** in the process server **40** shifts to the request reception waiting state (step **210**).

[0073] Should an edited data acquisition request be received from the user client **70**, the process server **40** carries out the process upon receipt of an edited data transmission request (steps **210**, **220**, **240**). However, in this case, the edited data acquiring unit **49** cannot acquire edited data corresponding to the process ID contained in the edited data acquisition request, but acquires only the storage place information (N in step **242**). Therefore, the storage place information transmitting unit **51** sends the storage place information to the user client **70** having sent the edited data transmission request (step **244**).

[0074] With the storage place information received as a response from the process server **40** (N in step **305**), the edited data receiving unit **76** of the user client **70** having sent the edited data transmission request instructs the document acquiring unit **71** to acquire the document from the file server **30** (step **312**). With the above, the document stored in the document memory **74** is updated by the latest document acquired from the file server **30**. Consequently, the produced edited data and the document are both held in the user client **70**.

[0075] It should be noted that, whereas the file server **30** is provided as a storage unit of a common document in this exemplary embodiment, any client **20**, rather than the file server **30**, may be provided as the storage unit of a common document, for example, as long as the document can be stored for common use by the respective clients **20**.

[0076] It should be noted that, instead of an arrangement in which a document, or one example of a data file format, is directly edited to produce edited data and the edited data is attached to the document before being stored, as in this exemplary embodiment, the present invention is also applicable to a case in which information related to a target data file is edited to produce edited data and the produced edited data is attached to the document. Further, the present invention is applicable to a case in which data acquired in an information acquiring process or the like is attached to the document.

[0077] The foregoing description of the embodiments of the present invention has been provided for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Obviously, many modifications and variations will be apparent to practitioners skilled in the art. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, thereby enabling others skilled in the art to understand the invention for various embodiments and with the various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the following claims and their equivalents.

What is claimed is:

1. A data file edit system, comprising:

a file storage unit that stores a data file;

a provider client that provides a data file to be stored in the file storage unit;

a user client that uses the data file stored in the file storage unit; and

a process server that carries out an edit process requested on the data file,

wherein

the provider client comprises

an edit request transmitting unit that transmits an edit request which contains an edit target data file and edit instruction information for the data file, to the process server,

an edit process attribute information receiving unit that receives edit process attribute information transmitted from the process server in response to the edit request transmitted from the edit request transmitting unit, and

a file registration unit that registers the edit target data file and the edit process attribute information associated with the data file in the file storage unit,

the process server comprises

an edit request receiving unit that receives the edit request transmitted from the provider client,

a file information memory that stores the data file contained in the edit request received by the edit request receiving unit,

a generation unit that generates the edit process attribute information which contains process identifying information associated with the edit process to be carried out in response to the edit request received by the edit request receiving unit,

an attribute information transmitting unit that transmits the edit process attribute information generated by the generation unit to the provider client having transmitted the edit request,

an edit process execution unit that carries out an edit process specified by the edit instruction information contained in the edit request, on the data file stored in the file information memory,

an edited data memory that stores edited data generated in the edit process carried out by the edit process execution unit,

a transmission request receiving unit that receives an edited data transmission request transmitted from the user client, and

an edited data transmitting unit that reads the edited data from the edited data memory, the edited data generated in an edit process specified by the process identifying information contained in the edited data transmission request, received by the transmission request receiving unit, and transmits to the user client having transmitted the edited data transmission request, and

the user client comprises

an acquiring unit that acquires the data file and the edit process attribute information associated with the data file,

a transmission request transmitting unit that transmits the edited data transmission request which contains the process identifying information acquired by the acquiring unit to the process server, and

an edited data receiving unit that receives the edited data transmitted from the process server in response to the edited data transmission request transmitted from the transmission request transmitting unit.

2. The data file edit system according to claim **1**, wherein the user client further comprises an edited data registration unit that registers the edited data received by the edited data receiving unit in the file storage unit so as to be associated with the data file.

3. The data file edit system according to claim **1**, wherein the user client further comprises a post-process request transmitting unit that transmits, after acquisition of all of the edited data generated in the edit process specified by the process identifying information contained in the edit process attribute information, a post-edit process request which contains the process identifying information and storage place information about all of the edited data to the process server,

the process server further comprises

a post-process request receiving unit that receives the post-edit process request transmitted from the user client,

a deletion unit that deletes the edited data generated in the edit process specified by the process identifying information contained in the post-edit process request from the edited data memory and the edit target data file from the file information memory,

a storage place information registration unit that registers the storage place information contained in the post-edit process request in the file information memory so as to be associated with the process identifying information, and

a storage place information transmitting unit that transmits, with the edited data generated in the edit process specified by the process identifying information contained in the edited data transmission request deleted by the deletion unit, the storage place information registered in the file information memory so as to be associated with the process identifying information to the user client having transmitted the edited data transmission request.

4. A storage medium storing a data file process program causing a process server that carries out a requested edit process on a data file, to carry out a process, the process server included in a data file edit system together with a file storage unit that stores a data file, a provider client that provides a data file to be stored in the file storage unit, and a user client that uses the data file stored in the file storage unit, the process comprising:

receiving an edit request transmitted from the provider client;

generating edit process attribute information which contains process identifying information associated with an edit process to be carried out in response to the edit request;

transmitting the edit process attribute information to the provider client having transmitted the edit request;

carrying out an edit process specified by edit instruction information contained in the edit request, on the data file stored in a file information memory that stores the data file contained in the edit request;

storing edited data generated in the edit process in an edited data memory;

receiving an edited data transmission request transmitted from the user client; and

reading the edited data from the edited data memory, the edited data generated in the edit process specified by the process identifying information contained in the edited data transmission request received, and transmitting to the user client having transmitted the edited data transmission request.

5. The storage medium according to claim **4**, wherein the process further comprises

receiving a post-edit process request transmitted from the user client;

deleting edited data generated in an edit process specified by process identifying information contained in the post-edit process request from the edited data memory and an edit target data file from the file information memory;

registering file storage place information contained in the post-edit process request in the file information memory so as to be associated with the process identifying information; and

transmitting, with the edited data generated in the edit process specified by the process identifying information contained in the edited data transmission request deleted, the storage place information registered in the file information memory so as to be associated with the process identifying information, to the user client having transmitted the edited data transmission request.

6. A storage medium storing a data file use program causing a user client that uses a data file stored in a file storage unit, to carry out a process, the user client included in a data file edit system together with the file storage unit that stores a data file, a provider client that provides a data file to be stored in the file storage unit, a process server that carries out an edit process requested on the data file, the process comprising:

acquiring the data file;

retrieving process identifying information from edit process attribute information attached to the acquired data file, and transmitting an edited data transmission request which contains the process identifying information to the process server specified by server identifying information contained in the edit process attribute information; and

receiving edited data transmitted from the process server in response to the edited data transmission request.

7. The storage medium according to claim **6**, wherein the process further comprising registering the edited data received in the file storage unit so as to be associated with the data file.

8. The storage medium according to claim **6**, wherein the process further comprising transmitting, after acquisition of all of the edited data generated in the edit process specified by the process identifying information contained in the edit process attribute information, a post-edit process request, which contains the process identifying information and storage place information about all of the edited data, to the process server.

9. A process server included in a data file edit system together with a file storage unit that stores a data file for common use so as to be accessed only from a client, a provider client for use by a provider of the data file stored in the file storage unit, and a user client for use by a user using the data file stored in the file storage unit, comprising:

an edit request receiving unit that receives an edit request transmitted from the provider client;

a generation unit that generates edit process attribute information which contains process identifying information for identifying an edit process to be carried out in response to the edit request received by the edit request receiving unit and its own server identifying information;

an attribute information transmitting unit that transmits the edit process attribute information generated by the generation unit to the provider client having transmitted the edit request; and

an editing unit that carries out an edit process specified by the edit instruction information contained in the edit request, on a data file stored in the file information memory that stores the data file contained in the edit request received by the edit request receiving unit, and storing edited data generated in the edit process in an edited data memory.

10. A user client included in a data file edit system together with a file storage unit that stores a data file for common use so as to be accessed only from a client, a provider client for use by a provider of the data file stored in the file storage unit, and a process server that carries out an edit process requested on the data file, comprising:

an acquiring unit that acquires a data file;

a transmission request transmitting unit that retrieves process identifying information from edit process attribute information attached to the data file acquired by the acquiring unit, and transmitting an edited data transmission request which contains the process identifying information to the process server specified server identifying information contained in the process identifying information;

an edited data receiving unit that receives edited data transmitted from the process server in response to the edited data transmission request transmitted from the transmission request transmitting unit; and

an edited data registration unit that registers the edited data received by the edited data receiving unit in the file storage unit so as to be associated with the data file.

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